

With lessened carbon content the boil diminishes, and presuming that there are, up to then, at all times sufficient amounts of oxygen present in the slag, at about 01 per cent. C becomes quite feeble, in that only isolated gas bubbles rise up out of the bath.

Inseparably accompanying the removal of the carbon is another weighty occurrence, the raising of the melting point of the metal. The lower the metal is in carbon, the less fusible it is. Therefore, during the entire period of the removal of carbon, a large quantity of heat must be introduced into the metal. When the decarbonisation is ended, the metal then lies quietly again, and the transference of heat to the lower layers can only occur by conduction, and this takes place more slowly than the radiation of heat through the hearth. The lower layers of metal cool down, therefore, and bring the bath into a condition which does not longer allow of smooth casting. Therefore, the charge must be tapped as soon as the carbon content has been brought down to the desired extent.

5. SULPHUR (IN BASIC OPEN-HEARTH FURNACES).

In addition to the substances Si, P, Mn and S, considered, there are other substances which are never entirely absent in iron, and the properties of the same in all cases act wholly unfavourably. These substances are sulphur and oxygen. Both, even in extremely small amounts, give rise to red-shortness and since iron in all working in the open hearth has an opportunity at least to take up sulphur, so is one obliged to see the smallest possible content of the same in the products of the open-hearth furnace, if one intends to make only really first-class metal. Iron combines easily with sulphur, and it is capable of taking this up from otherwise stable sulphur compounds. Amongst others, also, it decomposes sulphate of lime (according to Finkener, "St. u. E.," 1908, p. 1021, and 1898, p. 50), according to the equation $\text{CaSO}_4 + 4\text{Fe} = \text{FeS} + \text{CaO} + 8\text{FeO}$ and the sulphur goes over into the iron as iron sulphide.

The author has in remembrance an instance in practice where, by inadvertence, some 100 kilogrammes of old boiler